

1 CLAIMS

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3 1. A valve for use in a downhole tool, the valve
4 comprising a substantially tubular body including a
5 first end for connection to a wireline lock or
6 packer, the first end having a first inlet
7 communicating with the string providing a flow path
8 of a first cross-sectional area; one or more ports
9 located on the body, the ports providing a flow path
10 of a combined cross-sectional area greater than the
11 first cross-sectional area; a sealing assembly
12 comprising a seal cap moveable in relation to the
13 body to open and close the ports; wherein fluid flow
14 through the inlet moves the seal cap to open the
15 valve and create an unimpeded flow path between the
16 inlet and the ports with negligible pressure drop.

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18 2. A valve as claimed in Claim 1 wherein the combined
19 cross-sectional area of the ports is greater than
20 half the surface area of the tubular body at the
21 ports.

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23 3. A valve as claimed in Claim 1 or Claim 2 wherein the
24 seal cap is a poppet having a first sealing surface
25 and a second sealing surface is a seat located on an
26 inner surface of the tubular body such that when the
27 surfaces contact they form a seal to close the valve.

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29 4. A valve as claimed in Claim 3 wherein the sealing
30 assembly includes biasing means to bias the poppet
31 and the first sealing surface towards the second
32 sealing surface.

- 1 5. A valve as claimed in Claim 4 wherein the biasing
- 2 means is a spring, the spring enclosed within a
- 3 housing.
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- 5 6. A valve as claimed in any preceding Claim wherein the
- 6 valve includes pressure release means to open the
- 7 valve at a predetermined fluid pressure.
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- 9 7. A valve as claimed in Claim 6 wherein the pressure
- 10 release means is a shear ring which rated to shear at
- 11 the desired pressure.
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- 13 8. A valve as claimed in any one of Claims 4 to 7
- 14 wherein a load adjuster is located between the
- 15 biasing means and the first surface to vary the load
- 16 applied by the first surface upon the second surface.
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- 18 9. A valve as claimed in and preceding Claim wherein the
- 19 valve is a high lift injection valve.
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- 21 10. A method of injecting fluid into a well bore, the
- 22 method comprising the steps:
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- 24 (f) locating an injection valve on an anchoring
- 25 device at an end of a work string;
- 26 (g) running the string to a required depth;
- 27 (h) sealing the string to a wall of the well bore
- 28 using the anchoring device;
- 29 (i) passing fluid at a first pressure through the
- 30 work string; and
- 31 (j) using the fluid to open the valve and thereby
- 32 inject fluid through an unimpeded path through

- 1 the valve into the well bore while maintaining
2 fluid pressure at the first pressure.
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- 4 11. A method as claimed in Claim 10 wherein the injection
5 valve is according to and one of Claims 1 to 9.
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- 7 12. A method as claimed in Claim 10 or Claim 11 wherein
8 the method includes the step of trapping pressure
9 below the valve.
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- 11 13. A method as claimed in any one of Claims 10 to 13
12 wherein the method includes the step of performing
13 one or more pressure tests above the valve.